

Mathematics	(Group-I)	PAPER: II
Time: 30 Minutes	(OBJECTIVE TYPE)	Marks: 20

**Note:** Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1-  $\int (2x + 3)^{1/2} dx = :$

(a)  $\frac{(2x + 3)^{3/2}}{2} + c$       (b)  $\frac{1}{3} (2x + 3)^{3/2} + c \checkmark$   
 (c)  $\frac{1}{2} (2x + 3)^{1/3} + c$       (d)  $\frac{1}{3} (2x + 3)^{-1/2} + c$

2- Distance between A (3, 1) and B (-2, -4) is:

(a)  $\sqrt{17}$       (b)  $5\sqrt{2} \checkmark$   
 (c)  $\sqrt{26}$       (d)  $2\sqrt{5}$

3- If  $f(x) = \frac{x}{x^2 - 4}$ , then range of  $f(x)$  is:

(a) All real number  $\checkmark$   
 (b) Rational number  
 (c) All negative real number  
 (d) Integer

4- Slope 'm' through A( $x_1, y_1$ ) B( $x_2, y_2$ ) is:

(a)  $\frac{x_2 - x_1}{y_2 - y_1}$       (b)  $\frac{x_2 + x_1}{y_2 - y_1}$   
 (c)  $\frac{y_2 - y_1}{x_2 - x_1} \checkmark$       (d)  $\frac{y_1 - y_2}{x_1 + x_2}$

5-  $\lim_{x \rightarrow 0} \frac{\sin ax}{\sin bx} = :$

(a)  $\frac{b}{a}$       (b)  $a$   
 (c)  $\frac{a}{b} \checkmark$       (d)  $\frac{1}{b}$

6-  $\int (a - 2x)^{3/2} dx = :$

(a)  $\frac{1}{5} (a - 2x)^{3/2} + c$

(b)  $\frac{1}{5} (a - 2x)^{5/2} + c$

(c)  $-\frac{1}{5} (a - 2x)^{5/2} + c \checkmark$

(d)  $-\frac{3}{5} (a - 2x)^{5/2} + c$

7-  $\int \sec x dx = :$

(a)  $\sec x + \tan x$  (b)  $\sec^2 x$

(c)  $\ln |\sec x - \tan x|$  (d)  $\ln |\sec x + \tan x| + c \checkmark$

8- If  $f(x) = \frac{1}{x^m}$ , then  $f'(x) = :$

(a)  $-xm^{-1}$  (b)  $-mx^{-m-1} \checkmark$

(c)  $-mx^{-m+1}$  (d)  $-m^{-1}x$

9- Mid-point of the line segment joining A(3, 1) and B(-2, -4) is:

(a)  $\left(\frac{1}{2}, -\frac{3}{2}\right) \checkmark$  (b)  $\left(\frac{5}{2}, \frac{5}{2}\right)$

(c)  $\left(\frac{1}{2}, \frac{3}{2}\right)$  (d)  $\left(\frac{1}{2}, \frac{5}{2}\right)$

10- The derivative of  $\frac{1}{1+x}$  is:

(a)  $x$  (b)  $1+x$

(c)  $(1+x)^{-2}$  (d)  $-1(1+x)^{-2} \checkmark$

11- In circle  $x^2 + y^2 + 2gx + 2fy + c = 0$ , the radius is:

(a)  $\sqrt{g^2 + f^2 + c}$  (b)  $g^2 + f^2 - c$

(c)  $\sqrt{g^2 + f^2 - c} \checkmark$  (d)  $g^2 + f^2 + c$

12-  $x = 5$  is the solution of inequality:

(a)  $2x - 3 > 0 \checkmark$  (b)  $2x + 3 < 0$

(c)  $x + 4 < 0$  (d)  $x + 3 < 0$

13- In vectors  $\vec{a} \times \vec{b} = :$

(a)  $\vec{b} \times \vec{a}$  (b)  $-\vec{b} \times \vec{a}$  ✓  
(c)  $-\vec{b}$  (d)  $-\vec{a} \times \vec{b}$

14- In equation of circle  $x^2 + y^2 = r^2$ , the centre of circle is:

(a)  $(x, y)$  (b)  $(0, 0)$  ✓  
(c)  $(1, 0)$  (d)  $(0, r)$

15- Magnitude of vector  $\vec{u} = 2i - 7j$  is:

(a)  $\sqrt{53}$  ✓ (b)  $\sqrt{55}$   
(c)  $\sqrt{48}$  (d)  $\sqrt{52}$

16-  $\frac{d}{dx} (\cos^{-1} x) = :$

(a)  $\frac{1}{\sqrt{1-x^2}}$  (b)  $\frac{-1}{\sqrt{1-x^2}}$  ✓  
(c)  $\frac{1}{\sqrt{1+x^2}}$  (d)  $\frac{1}{1+x^2}$

17-  $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$  is Maclaurin series for:

(a)  $e^x$  ✓ (b)  $\sqrt{1+x}$   
(c)  $\cos x$  (d)  $\sin x$

18- The vector  $\vec{PQ}$  through  $P(0, 5)$  and  $Q(-1, -6)$  is:

(a)  $[-1, 11]$  (b)  $[-1, -11]$  ✓  
(c)  $[0, 11]$  (d)  $[1, 1]$

19-  $\frac{d}{dx} \tan^{-1} x = :$

(a)  $\frac{1}{1-x^2}$  (b)  $\frac{1}{\sqrt{1-x^2}}$   
(c)  $\frac{1}{\sqrt{1+x^2}}$  (d)  $\frac{1}{1+x^2}$  ✓

20- The focus of parabola  $y^2 = 4ax$  is:

(a)  $(0, a)$  (b)  $(-a, 0)$   
(c)  $(a, 0)$  ✓ (d)  $(0, -a)$